Core Topics in Operating Department Practice

Anaesthesia and Critical Care

Recent developments to medical career structures and roles and responsibilities have raised the profile of operating department practitioners (ODPs). Required knowledge is vast, and exams must be sat in working towards statutory registration. This is the first in a series of three books providing comprehensive information for healthcare staff working in the operating department. Topics include anaesthesia, critical care, postinterventional care, enhancing care delivery, professional practice, leadership and resource management. The clear and concise format is ideally suited to study and qualification as well as continued reference during practice. Written by specialists with a wealth of knowledge and experience to offer, and incorporating problem-based learning from case studies, this book will be important for ODPs and theatre nurses throughout the UK, in Australia where the same structures have been adopted, and worldwide for all professionals working in operating departments.

Brian Smith is Senior Lecturer in Continuing Professional Development at Edge Hill University, Liverpool.

Paul Rawling is Senior Lecturer in Operating Department Practice at Edge Hill University, Liverpool.

Paul Wicker is Head of Operating Department Practice Programmes at Edge Hill University, Liverpool.

Chris Jones is Senior Lecturer in Continuing Professional Development at Edge Hill University, Liverpool.

Core Topics in **Operating Department Practice**

Anaesthesia and Critical Care

Brian Smith Paul Rawling Paul Wicker Chris Jones



> CAMBRIDGE UNIVERSITY PRESS Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo

Cambridge University Press The Edinburgh Building, Cambridge CB2 2RU, UK Published in the United States of America by Cambridge University Press, New York

www.cambridge.org Information on this title: www.cambridge.org/9780521694230

© Cambridge University Press 2007

This publication is in copyright. Subject to statutory exception and to the provisions of relevant collective licensing ageements, no reproduction of any part may take place without the written permission of Cambridge University Press.

Printed in the United Kingdom at the University Press, Cambridge

A catalogue record for this publication is available from the British Library

Library of Congress Cataloging-in-Publication Data

Core topics in operating department practice : anaesthesia and critical care / Brian Smith . . . [et al.]. p. ; cm.

Includes bibliographical references and index.
ISBN-13: 978-0-521-69423-0 (pbk.)
ISBN-10: 0-521-69423-X (pbk.)
1. Anesthesia. 2. Critical care medicine. I. Smith, Brian, 1965-II. Title: Anesthesia and critical care.
[DNLM: 1. Anesthesia. 2. Critical Care. 3. Perioperative Care. WO 200 C797 2007]
RD81.C693 2007
617.9'6-dc22

2006038564

ISBN-13 978-0-521-69423-0 paperback ISBN-10 0-521-69423-X paperback

Cambridge University Press has no responsibility for the persistence or accuracy of URLs for external or third-party internet websites referred to in this publication, and does not guarantee that any content on such websites is, or will remain, accurate or appropriate.

Every effort has been made in preparing this publication to provide accurate and up-to-date information which is in accord with accepted standards and practice at the time of publication. Although case histories are drawn from actual cases, every effort has been made to disguise the identities of the individuals involved. Nevertheless, the authors, editors and publishers can make no warranties that the information contained herein is totally free from error, not least because clinical standards are constantly changing through research and regulation. The authors, editors and publishers therefore disclaim all liability for direct or consequential damages resulting from the use of material contained in this publication. Readers are strongly advised to pay careful attention to information provided by the manufacturer of any drugs or equipment that they plan to use.

Contents

Acknowledgements List of Contributors Foreword Preface		page vii ix xi xii
1	Introduction: anaesthetic practice. Past and present B. Smith and P. Wicker	1
2	Risk assessment T. Bewley	8
3	ECG monitoring in the recovery area C. Jones and T. Finn	17
4	The use of cricoid pressure during anaesthesia C. Wayne-Conroy	29
5	Anaesthetic breathing circuits N. Wright	35
6	Deflating the endotracheal tube pilot cuff M. Maguire	45
7	How aware are you? Inadvertent awareness under anaesthesia P. Rawling	52
8	Aspects of perioperative neuroscienc practice M. Woods	e 61
9	Resuscitation R. Campbell	77

vi **Contents**

10	Intravenous induction versus inhalation induction for general anaesthesia in paediatrics T. Hardcastle	102
11	Managing difficult intubations M. Sewell	110
12	Obstetric anaesthesia T. Williams	119
13	Understanding blood gases H. McNeill	130
14	Total intravenous anaesthesia K. Henshaw	145
15	Anaesthesia and electro-convulsive therapy M. Bottell	154

16	Mechanical ventilation of the patient J. Nolan	161
17	Perioperative myocardial infarction M. Parsonage	172
18	Developing a portfolio G. Hall	183
19	Accountability in perioperative practice S. Wordsworth	191
Index		201

Acknowledgements

We would like to thank the publishers for their support and especially Mr Geoffrey Nuttall for being encouraging towards us.

A special mention must go to Dr Simon Bricker (Consultant Anaesthetist) for writing the foreword and above all a key critic in the development of this book.

Finally, a personal thank you to our colleagues who have given their time, dedication, and expertise to each unique chapter. Their strength and commitment to this book has been duly noted and appreciated.

> Brian Smith, Paul Rawling, Paul Wicker, Chris Jones Liverpool 2006

Contributors

Toni Bewley

Royal Liverpool Children's NHS Trust and Faculty of Health Edge Hill University Liverpool

Mark Bottell

St. Helens & Knowsley Hospital Trust Whiston Hospital Prescot, Merseyside

Robert Campbell

Liverpool Women's Hospital Liverpool

Trish Finn

Aintree Cardiac Centre University Hospital Aintree Liverpool

Gill Hall

Respiratory Education UK Liverpool

Teresa Hardcastle

Faculty of Health Edge Hill University Liverpool

Kevin Anthony Henshaw

Faculty of Health Edge Hill University Liverpool

x Contributors

Chris Jones Faculty of Health Edge Hill University Liverpool

Helen McNeill Faculty of Health Edge Hill University Liverpool

Martin Maguire University Hospital Aintree Liverpool

Jill Nolan Intensive Care Unit Royal Liverpool and Broadgreen Hospital Liverpool

Maria Parsonage Wirral Hospitals NHS Trust Merseyside

Paul Rawling Faculty of Health Edge Hill University Liverpool

Michael A. Sewell Burnley General Hospital Burnley Brian Smith Faculty of Health Edge Hill University Liverpool

Cheryl Wayne-Conroy Faculty of Health Edge Hill University Liverpool

Paul Wicker Faculty of Health Edge Hill University Liverpool

Tom Williams Independent Academic Adviser Alicante

Margaret Woods Faculty of Health Edge Hill University Liverpool

Stephen L. Wordsworth Division of Operating Department Practice Faculty of Health The University of Central England Birmingham

Norman Wright Faculty of Health Edge Hill University Liverpool

Foreword

Most senior consultant anaesthetists will be able to recall times during their early careers when anaesthetic assistance in theatre could be described at best as rudimentary. There was often willing help for the anaesthetists but it was provided largely by those whose training, through no fault of their own, was negligible. It is true, of course, that the early anaesthetic assistants did not have to contend with the complex range of anaesthetic equipment that is now available, and it comes as a surprise to many, for instance, to learn that the use of pulse oximetry did not become routine in the operating theatre until the late 1980s. That chapters in this book include accounts of topics such as perioperative myocardial infarction, mechanical ventilation and awareness during anaesthesia indicates just how much progress has been made since those often unsatisfactory times. Further chapters on the development of a personal portfolio and on the implications of professional accountability also serve notice that the era of the Anaesthetic Practitioner is nigh: an era that the ODAs of twenty-five years ago could never have envisaged. The modern reality, finally, is that the theatre orderly of two or more decades ago is now a degree student, ODP, of whom is required an understanding of the basic sciences which underpin the safe practice of sophisticated modern anaesthesia. This book is the first of a series which should go much of the way towards fulfilling that ambition.

> Dr. Simon Bricker Consultant Anaesthetist The Countess of Chester Hospital

Preface

Healthcare in the UK has experienced intense change over the past few years, much of which has been focused on the perioperative environment. The NHS Plan, introduced by the Labour government in 2000, was at the forefront of the modernisation of the UK's National Health Service. Focusing on major areas of concern, such as modernisation of the workforce, increasing patient choice, and increasing the efficiency and effectiveness of patient care, the government strategy to rebuild the NHS has affected every segment of the care sector.

Perioperative practitioners have responded to these pressures by re-examining professional boundaries and roles within perioperative care. As practice has advanced to meet these new challenges, new roles have developed, including for example, the surgical care practitioner, anaesthesia practitioner, and non-medical prescribing practitioners. These roles have the potential to increase the quality of patient care, as well as offering an opportunity for perioperative practitioners to extend their skills, knowledge, and competencies.

The intention is to provide a series of books exploring all aspects of core practice in perioperative care. This book, the first of the series, focuses on developments in anaesthetic practice.

For many anaesthetic practitioners¹ the thought of further professional development can be

¹ The term 'anaesthetic practitioner' depicts the role of either an operating department practitioner or a nurse acting as assistant to the anaesthetist.

xiv Preface

daunting. The increasingly specialist area of anaesthetic practice has been mirrored by an increasing need for specialist knowledge. Consider, for example, the differing needs of a patient undergoing major vascular surgery, an elderly patient requiring hip arthroplasty and a young mother undergoing caesarean section under spinal anaesthesia. The advanced anaesthetic techniques available in a modern operating department mean that care for these groups of patients is vastly different.

The purpose of this book is therefore to support anaesthetic practitioners in the crucial process of professional development.

Key learning points are included at the beginning of each chapter to focus the reader on the main topics discussed. The editors have developed the content of this book to reflect current concerns in anaesthetic practice. The book does not try to cover the vast area of anaesthetic practice, instead it focuses on areas of concern where practitioners are developing new roles. The reader should draw on this publication as a key resource for contemporary practice and use it where fitting to apply theory into practice.

The book commences with introductory chapters looking at the advancing role of the anaesthetic practitioner and risk assessment in the anaesthetic environment. Risk assessment is seen as a core area of concern for anaesthetic practitioners because of the high-risk environment where they deliver patient care.

The book continues by exploring core areas of developing practice, such as electrocardiogram monitoring, applying cricoid pressure, breathing systems, preventing awareness under anaesthesia and developments in resuscitation. The chapters offer knowledge and understanding of key clinical issues which affect practitioners' practice.

Later chapters of the book look at issues in advanced anaesthetic practice, for example, managing difficult intubations, understanding total intravenous anaesthesia and infusion pumps and anaesthesia for patients undergoing electroconvulsive therapy.

The last two chapters of the book explore professional anaesthetic practice in relation to continual professional development – accountability and learning from practice through reflection and portfolio development.

It is at this point of great changes in anaesthetic practice that we offer this textbook, developed by specialists, to support the ongoing professional development of the anaesthetic practitioner.

> Brian Smith, Paul Rawling, Paul Wicker, Chris Jones Liverpool 2006